

- 41 -

## CLAIMS

1. A planar light source device comprising: a primary light source; a light guide leading light emitted from the primary light source, and having a light incident face to which the light emitted from the primary light source comes in, and a light emitting face from which the led light goes out; a light deflection element disposed adjacent to the light emitting face of the light guide; and a polarization separation element disposed on the side of a light outgoing surface of the light deflection element, and having a function of transmitting one of polarization components of an incident light and reflecting the other of the polarization components, wherein a full width at half maximum of a luminance distribution of the incident light upon the polarization separation element in a direction parallel to a travel direction of the light in the light guide is 25° or less.

2. The planar light source device according to claim 1, wherein the full width at half maximum of the luminance distribution of the incident light upon the polarization separation element in a direction vertical to the travel direction of the light in the light guide is 50° or less.

3. The planar light source device according to claim 1 or 2, wherein an average value of the full width at half maximum of the luminance distribution of the incident light upon the polarization separation element in directions vertical and parallel to the travel direction of the light in the light guide is 33° or less.

4. The planar light source device according to any one of claims 1 to 3, wherein the light deflection element has a light incoming surface positioned facing the light emitting face of the light guide and a light outgoing surface on the opposite side, and a plurality of elongated prisms extending substantially in parallel with one another are formed at least on

- 42 -

the light incoming surface.

5        5. The planar light source device according to any one of claims 1 to 3, wherein the primary light source comprises a spot light source, the light deflection element has a light incoming surface positioned facing the light emitting face of the light guide and a light outgoing surface on the opposite side, and a plurality of substantially arc-shape elongated prisms surrounding the primary light source are juxtaposed and formed at least on the light incoming surface.

10       6. The planar light source device according to claim 4 or 5, wherein each of the elongated prisms of the light deflection element comprises two prism faces, and at least one of the prism faces is a face other than a single flat face.

15       7. The planar light source device according to claim 6, wherein at least one of the prism faces includes at least one convex curved face.

20       8. The planar light source device according to claim 7, wherein at least one of the prism faces comprises at least one convex curved face, and at least one flat face, an inclination angle of the convex curved face or the flat face positioned on the side closer to the light outgoing surface is larger, and a difference between the inclination angle of the convex curved face or the flat face closest to the light outgoing surface and that of the flat face or the convex curved face most distant from the light outgoing surface is 15° or less.

25       9. The planar light source device according to claim 7, wherein at least one of the prism faces comprises at least two convex curved faces having mutually different inclination angles, an inclination angle of the convex curved face positioned on the side closer to the light outgoing surface is larger, and a difference between the inclination angle of the convex curved face closest to the light outgoing surface and that of the convex curved face most distant from the light outgoing surface is 15° or

- 43 -

less.

10. The planar light source device according to claim 6, wherein at least one of the prism faces comprises at least two flat faces having mutually different inclination angles, an inclination angle of any one of the flat faces positioned on the side closer to the light outgoing surface is larger, and a difference between the inclination angle of a flat face closest to the light outgoing surface and that of the flat face most distant from the light outgoing surface is  $15^\circ$  or less.

11. The planar light source device according to any one of claims 7 to 9, wherein a ratio ( $r/P$ ) of a curvature radius ( $r$ ) of the convex curved face to a pitch ( $P$ ) of the elongated prism is in a range of 2 to 50.

12. The planar light source device according to any one of claims 8 to 11, wherein at least two flat faces and/or convex curved faces are formed in a region having a height  $h$  from a prism apex portion, and  $h/H$  is 60% or less assuming that the height of the elongated prism is  $H$ .

13. The planar light source device according to any one of claims 8 to 12, wherein a ratio of a maximum distance ( $d$ ) between the flat face and/or the convex curved face, and a virtual plane connecting a prism apex portion to a prism bottom portion with respect to the pitch ( $P$ ) of the elongated prism is in a range of 0.05 to 5%.

14. The planar light source device according to any one of claims 4 to 13, wherein an apex angle of the elongated prism is in a range of  $35^\circ$  to  $80^\circ$ .

15. The planar light source device according to any one of claims 4 to 14, wherein one distributing angle  $\alpha$  of an apex angle of the elongated prism is  $40^\circ$  or less, and the other distributing angle  $\beta$  of the apex angle is in a range of  $25^\circ$  to  $50^\circ$ .

16. The planar light source device according to any one of claims 4 to 15, wherein one distributing angle  $\alpha$  of the apex angle of the elongated

- 44 -

prism is different from the other distributing angle  $\beta$ .

17. The planar light source device according to any one of claims 4 to 16, wherein each of the elongated prisms of the light deflection element comprises two prism faces, one of the prism faces comprises a flat face and/or a convex curved face, and the other prism face is a substantially flat face.

18. The planar light source device according to any one of claims 1 to 17, wherein a plurality of elongated lenses extending in a direction substantially vertical to the light incident face of the light guide and arranged substantially in parallel with one another in a plane along the light emitting face are formed on one of the light emitting face of the light guide and a back surface on the opposite side thereof.

19. The planar light source device according to any one of claims 1 to 18, wherein the polarization separation element comprises a plurality of sheets each having double refractive properties, and a refractive index difference between the adjacent sheets in a polarization direction of a reflected polarization component is smaller than that in a polarization direction of a transmitted polarization component.

20. The planar light source device according to any one of claims 1 to 19, further comprising: a light diffusion element disposed on the side of a light emitting surface of the polarization separation element.

21. The planar light source device according to claim 20, wherein the light diffusion element has a full width at half maximum of an emitted light luminous intensity distribution with incidence of parallel light in a range of 1 to 13°.

22. The planar light source device according to claim 20 or 21, wherein a haze value of the light diffusion element is in a range of 8 to 82%.